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The Acute Effect of Deep Ventilatory Training on Cortical and Cardiovascular Activity

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High-level athletes are generally resilient to stress and show neural efficiency when performing complex tasks (Hatfield, 2018). This state is a consequence of practice but can be facilitated by self-management techniques. One technique to reduce stress levels is the use of deep ventilatory training (DVT). DVT is a ventilatory maneuver that exaggerates inhalation and exhalation to slow the breathing rate to a pace of six breaths per minute. This technique is a conscious approach to manipulate the autonomic balance by engaging the parasympathetic branch. Previously reported, chronic effects of DVT exhibited improvements in mental health. Tactical athletes also utilize DVT as a stress coping mechanism, to improve focus and to maintain composure (Lewis, 2015). **PURPOSE:** To investigate the acute effects of DVT on cortical and cardiovascular activity. **METHODS:** Recruited twenty healthy young adults (age 18-30). Eligibility requirements included participants to have no prior experience in any mindfulness training, i.e., breathing training or meditation. The study involved two sessions; session order was counterbalanced. Each session participants performed either the DVT or the control condition. The study utilized electroencephalography (EEG) and electrocardiogram (ECG) to measure cortical and cardiovascular activities. Repeated measures ANOVA were conducted for statistical analysis. **RESULTS:** EEG results exhibited an increase in alpha power during DVT compared to the control condition (9.85 ± 4.23 vs. 7.45 ± 2.84, $F(1, 19)=7.942$, $p<0.05$). ECG results exhibited an increase in SDNN during DVT compared to the control condition (58.68±19.96 vs. 43.13±13.63, $F(1,19)=30.004$, $p<0.001$). **CONCLUSION:** Psychophysiological measures of this study provided evidence for an acute effect of DVT through a decrease in cortical activity. Specifically, during DVT, participants exhibited an increase in alpha power. Alpha power reflects inhibition of cortical activity. Along with decreases in cortical activity, cardiovascular measures also suggest an increase in parasympathetic activity. Overall, this study demonstrated an acute positive effect of DVT on cortical and cardiovascular activity, which may promote neural efficiency during competition.